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Description

[0001] The present invention concerns a centrifugal separator comprising a rotor, which is rotatable in a predetermined rotational direction around a rotational axis, and which forms an inlet for the liquid, which is to be centrifugally treated, and an outlet chamber for liquid separated in the rotor. The outlet chamber, which surrounds the rotational axis, is so designed that liquid present in the outlet chamber during operation forms a liquid body rotating around the rotational axis, the liquid body having a radially inwardly directed free liquid surface at a wanted radial level in the rotor. The centrifugal rotor also comprises a stationary discharge device, which is arranged in the outlet chamber and extends from the rotating liquid body radially inwardly to a central outlet. Inside itself the discharge device forms a flow channel with an inlet opening, which radially is located in the area where the free liquid surface is located during operation. During operation the inlet opening is located at least partly in the liquid body and via the flow channel the inlet opening is connected to the central outlet. The discharge device has a front contour projected in a plane perpendicular to the rotational axis and directed towards the rotational direction and a rear contour projected in this plane and directed in the rotational direction.

[0002] Seen radially outwardly the contour of the discharge device in known separators of this kind are often directed towards the rotational direction, the inlet opening being directed towards the rotational direction. Hereby, you can obtain a high pressure in the liquid discharged through the outlet. However, surfaces of the discharge device, which during operation is located in the rotating liquid body and is directed towards the rotational direction, cause a considerable splashing of the separating liquid in the outlet chamber, which results in a great energy consumption and a great danger that the air or gas, which during operation is located radially inside the free liquid surface, becomes entrained by the liquid, which is leaving the outlet chamber through the flow channels in the discharge device.

[0003] Some liquid drops splashing around the discharge device are entrained in the rotation of the co-rotating air or gasvolume radially inside the free liquid surface and are deposited onto the outside of the stationary discharge device. Along the outside of the discharge device liquid flows radially inwardly towards central parts of the discharge chamber where liquid might flow through central openings into another outlet chamber for another component separated out of the supplied liquid, which must not be contaminated by the separated liquid.

[0004] A centrifugal separator and a discharge device having the features as set forth in the preamble of claim 1 and claim 7 are known for example in document FI-B-52029.

[0005] In a centrifugal separator known from EP A1 0 058 353 the discharge device is designed as awing, which with internal flow channels extends radially outwardly into the rotating liquid body in such a way that a flow of liquid may take place along the discharge device with a relatively small flow resistance. By designing the discharge device in this manner the splashing of the separated liquid around the discharge device decreases and, thereby, the danger that air or gas is entrained in the flow of the separated liquid out of the separator decreases. However, the surfaces of the discharge device directed towards the oncoming rotational direction result in quite a lot of splashing taking place during operation around the discharge device in spite of this design of the discharge device, and the danger of having air or gas admixed into the separated liquid flowing out of this centrifugal separator is also relatively great.

[0006] One object of the present invention is to accomplish a centrifugal separator of the kind initially described, in which the above described splashing around the discharge device is slight and the danger of having air or gas entrained by the flow of the separated liquid out of the centrifugal separator is low, and in which the separated liquid can be discharged at low energy consumption. Another object of the invention is to accomplish a centrifugal separator, in which liquid does not flow radially inwardly along the outside of the discharge device so that the danger of having it passing into another outlet chamber for another component separated out of the supplied liquid, where said component must not be contaminated by the separated liquid, is reduced or eliminated.

[0007] This is accomplished according to the present invention by a centrifugal separator of this kind having a discharge device, the front and rear contours of which in a plane essentially perpendicular to the rotational axis seen radially outwardly have a directional component in the rotational direction along essentially their whole extensions, the front contour being so curved at the free liquid surface in said plane that, nearby and radially outside the free liquid surface, it is directed essentially in the rotation direction.

[0008] Hereby, the separated liquid in the rotating liquid body is brought to follow the outside of the discharge device gently and the splashing around the discharge device is strongly reduced and the above mentioned radially inwardly directed flow of liquid, which is located on the outside of the stationary discharge device radially inside the free liquid surface, is counteracted by the contact with the rotating air or gas flow radially inside the free liquid surface.

[0009] In a preferred embodiment the contours are so curved in said plane that their directional component in the rotational direction increases with increasing radius.

[0010] In a special embodiment the inlet opening has an extension in the rotation direction and is delimited and surrounded by an edge, which upstream has a front edge portion and downstream has a rear edge portion, at least the rear edge portion being located during operation radially outside the free liquid surface and a

straight line drawn through said edge portions forms an angle with a tangent to the free liquid surface at the inlet opening, the vertex of the angle being directed in the rotational direction and the angle being greater than 20° but smaller than 50°.

[0011] With advantage at least the portion of the discharge device, which forms the inlet opening, is arranged radially movable in such a way that the radial position of the inlet opening can be varied.

[0012] In the following the invention will be described more closely with reference to the attached drawings, in which

figure 1 schematically shows an axial section through a part of a centrifugal separator according to the invention,

figure 2 shows a section along the line II-II in figure 1, and

figure 3 shows an embodiment of a detail in figure 2.

[0013] In figure 1 there is shown a part of a centrifugal separator comprising a rotor, which has a lower part 1 and an upper part 2, which are joined together axially by means of a locking ring 3. Inside the rotor there is arranged an axially movable valve slide 4. This valve slide 4 delimits together with the upper part 2 a separation chamber 5 and is arranged to open and close an outlet passage between the separation chamber 5 and the outlet opening 6 for letting out intermittently a component, which has been separated from a mixture supplied to the rotor and has collected at the periphery of the separation chamber 5. The valve slide 4 delimits together with the lower part 1 a closing chamber 7, which is provided with an inlet 8 and a throttled outlet 9 for a so called closing liquid. During the rotation of the rotor the valve slide 4 is pressed by the pressure of the closing liquid present in the closing chamber 7 under the influence of the centrifugal force into sealing abutment against a gasket 10 arranged in the upper part 2.

[0014] Inside the separation chamber 5 a disc stack 11 consisting of a number of conical separation discs is arranged between a distributor 12 and a top disc 13. In the example shown in figure 1 the rotor is mounted on a hollow shaft 14, through which the liquid to be centrifugally treated is supplied to the rotor. The top disc 13 forms at its upper end (as shown in the figure) a centrally located first outlet chamber 15 for a specific lighter liquid-component separated in the separation chamber 5. This first outlet chamber 15 communicates with the separation chamber 5 via a first overflow outlet 16, over which the specific lighter liquid component can flow out of the separation chamber 5.

[0015] The upper part of the rotor 2 forms a centrally located second outlet chamber 17, into which a specific heavier liquid component can flow from a radially outer portion of the separation chamber 5 via a passage 18 and a second overflow outlet 19.

[0016] In each outlet chamber there is arranged a stationary discharge device, a first discharge device 20 and a second discharge device 21. These discharge devices are provided with peripheral inlet openings, first inlet openings 22 and second inlet openings 23, respectively, which are connected to central outlets, a first outlet 24 and a second outlet 25, respectively. The discharge devices 20 and 21 extend mainly perpendicular to the rotational axis radially so far out that during operation they are partly located in a rotating liquid body located in the outlet chambers 15 and 17, respectively.

[0017] The design of the second discharge device 21 is disclosed more closely by the section shown in Figure 2 which is along the line II-II in figure 1. In the outlet chamber 17 the discharge device 21 extends with the flow channel 26 formed therein from the free liquid surface, which in the figure is marked with a triangle, radially inwardly to the interior of an outlet tube 27.

[0018] At the free liquid surface the discharge device has an inlet opening 23, through which a liquid separated during operation and rotating in the outlet chamber 17 can be discharged out of the outlet chamber 17.

[0019] The rotational direction of the rotor, the rotating liquid body and the entrained air or gas flow is shown by the arrow drawn in the figure. Toward the rotation direction the discharge device 21 has a front contour 28 in a plane essentially perpendicular to the rotational axis and in the rotation direction the discharge device 21 has a rear contour 29 in this plane. Seen radially outwardly the contour 28 and 29 have a directional component in the rotational direction along essentially their whole extensions.

[0020] Along at least a portion of the rear contour 29 the discharge device has a fin 30, which extends radially along the discharge device 21 and in the rotation direction. This fin 30 increases the stiffness of the discharge device and has a stabilizing influence on the rotating liquid and/or gas flow in the outlet chamber 17.

[0021] In figure 3 there is shown a preferred embodiment of a radially outer portion of a discharge device 31 according to the invention. According to this embodiment the discharge device 31 has an inlet opening 32, which upstream is delimited by a front edge portion 33 and downstream is delimited by a rear edge portion 34. At least the rear edge portion 34 is located during operation radially outside the free liquid surface. A straight line 35-connecting these edge portions 33 and 34 forms an angle V with a tangent to the free liquid surface at the inlet opening 32. This angle has the vertex directed in the rotational direction and is greater than 20° but smaller than 50°. The inlet opening then constitutes an interruption of the front contour of the discharge device, which still nearby and radially outside the free liquid surface is directed essentially in the rotational direction.

[0022] The centrifugal separator shown in the figures works in the following manner:

[0023] In connection with the starting of a centrifugal

separator of this kind and bringing the rotor to rotate the separation chamber 5 is closed by supplying a closing liquid to the closing chamber 7 through the inlet 8. As soon as the separation chamber 5 is closed the liquid mixture, which is to be centrifugally treated, is supplied to the separation chamber 5 through the hollow shaft 14. When the rotor has reached the rotational speed of operation and the separation chamber 5 has been filled up, the components contained in the liquid mixture are separated by the influence of centrifugal forces acting on them. The separation is then mainly taking place in the intermediate spaces between the conical discs in the disc stack 11. During separation a specific heavier liquid component is thrown radially out towards the periphery of the separation chamber 5 where it is accumulated, while a specific lighter liquid component flows radially inwards in these intermediate spaces.

[0024] If the centrifugally treated liquid mixture also contains specific heavy particles these are accumulated at the outermost periphery of the separation chamber 5.

[0025] The specific lighter liquid component flows into the first outlet chamber 15 via the first overflow outlet 16, which, thereby, determines the radial level of the free liquid surface in the separation chamber 5. The light liquid component is discharged under pressure out of the centrifugal rotor through a first outlet 24 via the first stationary discharge device 20, which in this case consists of a conventional paring disc.

[0026] The specific heavier liquid component, which has been accumulated at the periphery of the separation chamber 5, flows radially inwards through the passage 18 and further via the overflow-outlet 19 into the outlet chamber 17. Herein it forms a cylindrical annular liquid body which is kept in rotation during use. During operation the second discharge device 21 extends radially so far out in the second outlet chamber 17 that a minor part thereof is immersed in the rotating liquid body. However, such a great portion of the discharge device 21 is immersed in the rotating liquid body that at least a part of the inlet opening 23 or 32 is located in the rotating liquid. Hereby, the friction between the outside of the second discharge device 21 and the rotating liquid body is low. Through the second discharge device 21 the specific heavier liquid component is discharged under pressure out of the centrifugal separator through the second outlet 25.

[0027] In the example shown in figure 1 the discharge device 21 is arranged to discharge during operation a separated specific heavier liquid component. Of course, a discharge device 21 designed according to the present invention can also be arranged to discharge a separated specific lighter liquid component.

Claims

1. Centrifugal separator comprising

- a rotor, which is rotatable in a predetermined rotational direction around a rotational axis and which forms an inlet for the liquid, which is to be centrifugally treated, and an outlet chamber (17) for a liquid separated in the rotor, the outlet chamber (17) surrounding the rotational axis and being so designed that liquid present in the outlet chamber (17) during operation forms a liquid body, which has a radially inwardly directed free liquid surface at a wanted radial level in the rotor, rotating around the rotational axis, and

- a stationary discharge device (21) arranged in the outlet chamber (17), which extends from the rotating liquid body radially inwardly to a central outlet (25) and inside itself forms a flow channel (26) with an inlet opening (23,32), which radially is located in the area where the free liquid surface is located during operation, and which during operation at least partly is located in the liquid body and via the flow channel (26) is connected to the central outlet (25), and which discharge device (21) has a front contour (28) projected in a plane perpendicular to the rotational axis and directed towards the rotational direction and a rear contour (29) projected in this plane and directed in the rotational direction,

characterized in

that the contours (28,29) seen radially outwardly have a directional component in the rotational direction along essentially their whole extensions, the front contour (28) being so curved in said plane at the free liquid surface that nearby and radially outside the free liquid surface it is directed essentially in the rotational direction.

2. Centrifugal separator according to claim 1, **characterized in** that the rear contour (29) is so curved in said plane that the directional component of it in the rotational direction increases with increasing radius.

3. Centrifugal separator according to claim 1 or 2, **characterized in** that the front contour (28) is so curved that the directional component of it in the rotational direction increases with increasing radius.

4. Centrifugal separator according to any of the previous claims, **characterized in** that the inlet opening (23,32) has an extension in the rotational direction.

5. Centrifugal separator according to claim 4, **characterized in** that the inlet opening (32) is delimited and surrounded by an edge, which upstream has a front edge portion (33) and downstream has a rear edge portion (34), at least the rear edge por-

tion (34) being located during operation radially outside the free liquid surface and a straight line (35) drawn through said edge portions (33,34) forms an angle (V) with a tangent to the free liquid surface at the inlet opening (32), which angle (V) has the vertex directed in the rotational direction and is greater than 20° but less than 50°.

6. Centrifugal separator according to any of the previous claims, **characterized in** that at least a portion of the discharge device (21,31), which forms the inlet opening (23,32) is radially movable in such a way that the radial position of the inlet opening (23,32) can be varied.

7. A discharge device for a centrifugal separator, the separator having a rotor, which is rotatable in a predetermined rotational direction around a rotational axis, and which forms an inlet for the liquid, which is to be centrifugally treated, and an outlet chamber (17) for a liquid separated in the rotor, the outlet chamber (17) surrounding the rotational axis and being so designed that liquid present in the outlet chamber (17) during operation forms a liquid body, which has a radially inwardly directed free liquid surface at a wanted radial level in the rotor, rotating around the rotational axis,
the discharge device (21) being intended to be arranged in the outlet chamber (17) and to extend from the rotating liquid body radially inwardly to a central outlet (25), and inside itself forms a flow channel (26) with an inlet opening (23,32), which radially is located in the area where the free liquid surface is located during operation, and which during operation at least partly is located in the liquid body and via the flow channel (26) is connected to the central outlet (25), and which discharge device (21) has a front contour (28) projected in a plane perpendicular to the rotational axis and directed towards the rotational direction and a rear contour (29) projected in this plane- and directed in the rotational direction,
characterized in
that the contours (28,29) seen radially outwardly have a directional component in the rotational direction along essentially their whole extensions, the front contour (28) being so curved in said plane at the free liquid surface that nearby and radially outside the free liquid surface it is directed essentially in the rotational direction.

8. A discharge device according to claim 7, **characterized in** that the rear contour (29) is so curved in said plane that the directional component of it in the rotational direction increases with increasing radius.

9. A discharge device according to claim 7 or 8, **characterized in** that the front contour (28) is so curved that the directional component of it in the rotational direction increases with increasing radius.

10. A discharge device according to claim 7, 8 or 9, **characterized in** that the inlet opening (23,32) has an extension in the rotational direction and is delimited and surrounded by an edge, which upstream has a front edge portion (33) and downstream has a rear edge portion (34), at least the rear edge portion (34) being located during operation radially outside the free liquid surface and a straight line (35) drawn through said edge portions (33,34) forms an angle (V) with a tangent to the free liquid surface at the inlet opening (32), which angle (V) has the vertex directed in the rotational direction and is greater than 20° but less than 50°.

Patentansprüche

1. Zentrifuge, umfassend:

   - einen Rotor, der in einer vorbestimmten Drehrichtung um eine Drehachse drehbar ist und einen Einlaß für die zentrifugal zu behandelnde Flüssigkeit bildet sowie eine Auslaßkammer (16) für die im Rotor abgetrennte Flüssigkeit, wobei die Auslaßkammer (17) die Drehachse umgibt und so ausgestaltet ist, daß in der Auslaßkammer (17) enthaltende Flüssigkeit während des Betriebs einen Flüssigkeitskörper bildet, der eine radial nach innen gerichtete freie Flüssigkeitsoberfläche an einem gewünschten radialen Ort im Rotor bildet, die sich um die Drehachse dreht, und

   - eine in der Auslaßkammer (16) angeordnete stationäre Ausgabevorrichtung (21), die sich vom drehenden Flüssigkeitskörper radial nach innen zu einem Mittelauslaß (25) erstreckt und in sich einen Strömungskanal (26) mit einer Einlaßöffnung (23, 32) bildet, die sich radial in dem Bereich befindet, wo sich die freie Flüssigkeitsoberfläche während des Betriebs befindet, und die sich während des Betriebs zumindest teilweise im Flüssigkeitskörper befindet und über den Strömungskanal (26) mit dem Mittelauslaß (25) verbunden ist, wobei die Ausgabevorrichtung (21) eine Vorderkontur (28) hat, die in einer Ebene senkrecht zur Drehachse hervorragt und zur Drehrichtung gerichtet ist, und eine Hinterkontur (29), die in dieser Ebene hervorragt und in die Drehrichtung gerichtet ist,

dadurch gekennzeichnet, daß
die Konturen (28,29) radial nach außen gesehen eine Richtungskomponente im wesentlichen entlang

ihrer gesamten Ausdehnung haben, wobei die Vorderkontur (28) in der Ebene an der freien Flüssigkeitsoberfläche so gekrümmt ist, daß sie in der Nähe und radial außerhalb der freien Flüssigkeitsoberfläche im wesentlichen in die Drehrichtung gerichtet ist.

2. Zentrifuge nach Anspruch 1, dadurch gekennzeichnet, daß die Hinterkontur (29) in der Ebene so gekrümmt ist, daß ihre Richtungskomponente in der Drehrichtung mit wachsendem Radius ansteigt.

3. Zentrifuge nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Vorderkontur (28) so gekrümmt ist, daß ihre Richtungskomponente in der Drehrichtung mit wachsendem Radius ansteigt.

4. Zentrifuge nach einem der vorangegangenen Ansprüche, dadurch gekennzeichnet, daß die Einlaßöffnung (23, 32) eine Ausdehnung in der Drehrichtung hat.

5. Zentrifuge nach Anspruch 4, dadurch gekennzeichnet, daß die Einlaßöffnung (32) von einer Kante begrenzt und umgeben wird, die stromaufwärts einen Vorderkantenabschnitt (33) aufweist und stromabwärts einen Hinterkantenabschnitt (34), wobei wenigstens der Hinterkantenabschnitt (34) während des Betriebs radial außerhalb der freien Flüssigkeitsoberfläche angeordnet ist und eine durch den Kantenabschnitt (33, 34) gezogene gerade Linie (35) einen Winkel (V) mit einer Tangente an der freien Flüssigkeitsoberfläche bei der Einlaßöffnung (32) bildet, wobei die Spitze des Winkels (V) in die Drehrichtung gerichtet ist und wobei der Winkel größer ist als 20°, aber kleiner als 50°.

6. Zentrifuge nach einem der vorangegangenen Ansprüche, dadurch gekennzeichnet, daß wenigstens ein Abschnitt der Ausgabevorrichtung (21, 31), der die Einlaßöffnung (23, 32) bildet, radial auf eine solche Weise beweglich ist, daß die radiale Position der Einlaßöffnung (23, 32) variiert werden kann.

7. Ausgabevorrichtung für eine Zentrifuge, wobei die Zentrifuge einen Rotor hat, der in einer vorbestimmten Drehrichtung um eine Drehachse drehbar ist und der einen Einlaß für die zentrifugal zu behandelnde Flüssigkeit bildet sowie eine Auslaßkammer (17) für eine im Rotor zu trennende Flüssigkeit, wobei die Auslaßkammer (17) die Drehachse umgibt und so ausgestaltet ist, daß die in der Auslaßkammer (17) befindliche Flüssigkeit während des Betriebs einen Flüssigkeitskörper bildet, der eine radial nach innen gerichtete freie Flüssigkeitsoberfläche an einem gewünschten radialen Ort im Rotor hat, die sich um die Drehachse dreht, wobei die Ausgabevorrichtung (21) in der Auslaßkammer (17) angeordnet ist und sich vom drehenden Flüssigkeitskörper radial nach innen zu einem Mittelauslaß (25) erstreckt und in sich einen Strömungskanal (26) mit einer Einlaßöffnung (23, 32) bildet, die sich radial in dem Bereich befindet, wo sich während des Betriebs die freie Flüssigkeitsoberfläche befindet, und die sich während des Betriebs mindestens teilweise im Flüssigkeitskörper befindet und über den Strömungskanal (26) mit dem Mittelauslaß (25) verbunden ist, wobei die Ausgabevorrichtung (21) eine Vorderkontur (28) hat, die in einer Ebene senkrecht zur Drehachse hervorragt und zur Drehrichtung gerichtet ist, und eine Hinterkontur (29), die in dieser Ebene hervorragt und in die Drehrichtung gerichtet ist, dadurch gekennzeichnet, daß die Konturen (28, 29) radial nach außen gesehen eine Richtungskomponente in der Drehrichtung im wesentlichen entlang ihrer gesamten Ausdehnung haben, wobei die Vorderkontur (28) in der Ebene an der freien Flüssigkeitsoberfläche so gekrümmt ist, daß sie in der Nähe und radial außerhalb der freien Flüssigkeitsoberfläche im wesentlichen in die Drehrichtung gerichtet ist.

8. Ausgabevorrichtung nach Anspruch 7, dadurch gekennzeichnet, daß die Hinterkontur (29) in der Ebene so gekrümmt ist, daß ihre Richtungskomponente in der Drehrichtung mit wachsendem Radius ansteigt.

9. Ausgabevorrichtung nach Anspruch 7 oder 8, dadurch gekennzeichnet, daß die Vorderkontur (28) so gekrümmt ist, daß ihre Richtungskomponente in der Drehrichtung mit wachsendem Radius ansteigt.

10. Ausgabevorrichtung nach Anspruch 7, 8 oder 9, dadurch gekennzeichnet, daß die Einlaßöffnung (23, 32) eine Ausdehnung in der Drehrichtung hat und von einer Kante begrenzt und umgeben wird, die stromaufwärts einen Vorderkantenabschnitt (33) und stromabwärts einen Hinterkantenabschnitt (34) hat, wobei sich mindestens der Hinterkantenabschnitt (34) während des Betriebs radial außerhalb der freien Flüssigkeitsoberfläche befindet und eine durch die Kantenabschnitte (33, 34) gezogene gerade Linie (35) einen Winkel (V) mit einer Tangente an der freien Flüssigkeitsoberfläche bei der Einlaßöffnung (32) bildet, wobei die Spitze des Winkels (V) in die Drehrichtung gerichtet ist und wobei der Winkel größer ist als 20°, aber kleiner als 50°.

Revendications

1. Séparateur centrifuge comprenant

   - un rotor pouvant tourner dans une direction de

rotation prédéterminée, autour d'un axe de rotation, et formant une admission destinée au liquide devant être traité par centrifugation, et une chambre de sortie (17) destinée à un liquide séparé dans le rotor, la chambre de sortie (17) entourant l'axe de rotation et étant agencée de façon telle que du liquide, présent dans ladite chambre de sortie (17) au cours du fonctionnement, forme un corps de liquide muni d'une surface libre du liquide dirigée radialement vers l'intérieur, à un niveau radial souhaité dans le rotor tournant autour de l'axe de rotation, et

- un dispositif stationnaire de décharge (21) logé dans la chambre de sortie (17), qui s'étend radialement vers l'intérieur à partir du corps de liquide en rotation, jusqu'à une sortie centrale (25), et forme, dans son propre espace interne, un canal d'écoulement (26) doté d'un orifice d'admission (23, 32), qui se trouve radialement dans la zone dans laquelle la surface libre du liquide est située au cours du fonctionnement et qui, au cours du fonctionnement, est au moins partiellement disposé dans le corps de liquide et est relié à la sortie centrale (25) par l'intermédiaire du canal d'écoulement (26), lequel dispositif de décharge (21) comprend un profil antérieur (28) en projection dans un plan perpendiculaire à l'axe de rotation, et orienté vers la direction de rotation, et un profil postérieur (29) en projection dans ledit plan et orienté dans la direction de rotation,

caractérisé par le fait
que, observés extérieurement dans le sens radial, les profils (28, 29) présentent une composante directionnelle dans la direction de rotation, pour l'essentiel le long de leurs étendues intégrales, le profil antérieur (28) offrant dans ledit plan, sur la surface libre du liquide, une courbure telle qu'il est orienté sensiblement dans la direction de rotation au voisinage direct de ladite surface libre du liquide, et radialement à l'extérieur de celle-ci.

2. Séparateur centrifuge selon la revendication 1, caractérisé par le fait que le profil postérieur (29) présente, dans ledit plan, une courbure telle que sa composante directionnelle, dans la direction de rotation, augmente au fur et à mesure de l'augmentation du rayon.

3. Séparateur centrifuge selon la revendication 1 ou 2, caractérisé par le fait que le profil antérieur (28) présente une courbure telle que sa composante directionnelle, dans la direction de rotation, augmente au fur et à mesure de l'augmentation du rayon.

4. Séparateur centrifuge selon l'une quelconque des revendications précédentes, caractérisé par le fait que l'orifice d'admission (23, 32) présente une étendue dans la direction de rotation.

5. Séparateur centrifuge selon la revendication 4, caractérisé par le fait que l'orifice d'admission (32) est délimité et entouré par un bord muni d'une région marginale antérieure (33) en amont, et d'une région marginale postérieure (34) en aval, au moins la région marginale postérieure (34) occupant, au cours du fonctionnement, une position radialement extérieure à la surface libre du liquide, et une ligne droite (35), tracée à travers lesdites régions marginales (33, 34), forme un angle (V) présentant une tangente à la surface libre du liquide sur l'orifice d'admission (32), le sommet dudit angle (V) étant orienté dans la direction de rotation, et ledit angle étant supérieur à 20°, mais inférieur à 50°.

6. Séparateur centrifuge selon l'une quelconque des revendications précédentes, caractérisé par le fait qu'au moins une partie du dispositif de décharge (21, 31), qui forme l'orifice d'admission (23, 32), est mobile radialement de telle sorte que la position radiale dudit orifice d'admission (23, 32) puisse être modifiée.

7. Dispositif de décharge pour un séparateur centrifuge, ledit séparateur comprenant un rotor pouvant tourner dans une direction de rotation prédéterminée, autour d'un axe de rotation, et formant une admission destinée au liquide devant être traité par centrifugation, et une chambre de sortie (17) destinée à un liquide séparé dans le rotor, la chambre de sortie (17) entourant l'axe de rotation et étant agencée de façon telle que du liquide, présent dans ladite chambre de sortie (17) au cours du fonctionnement, forme un corps de liquide muni d'une surface libre du liquide dirigée radialement vers l'intérieur, à un niveau radial souhaité dans le rotor tournant autour de l'axe de rotation,
le dispositif de décharge (21) étant conçu pour être logé dans la chambre de sortie (17), et pour s'étendre radialement vers l'intérieur à partir du corps de liquide en rotation, jusqu'à une sortie centrale (25), et formant, dans son propre espace interne, un canal d'écoulement (26) doté d'un orifice d'admission (23, 32), qui se trouve radialement dans la zone dans laquelle la surface libre du liquide est située au cours du fonctionnement et qui, au cours du fonctionnement, est au moins partiellement disposé dans le corps de liquide et est relié à la sortie centrale (25) par l'intermédiaire du canal d'écoulement (26), lequel dispositif de décharge (21) comprend un profil antérieur (28) en projection dans un plan perpendiculaire à l'axe de rotation, et orienté vers la direction de rotation, et un profil postérieur (29) en projection dans ledit plan et orienté dans la di-

rection de rotation,
caractérisé par le fait
que, observés extérieurement dans le sens radial, les profils (28, 29) présentent une composante directionnelle dans la direction de rotation, pour l'essentiel le long de leurs étendues intégrales, le profil antérieur (28) offrant dans ledit plan, sur la surface libre du liquide, une courbure telle qu'il est orienté sensiblement dans la direction de rotation au voisinage direct de ladite surface libre du liquide, et radialement à l'extérieur de celle-ci.

8. Dispositif de décharge selon la revendication 7, caractérisé par le fait que le profil postérieur (29) présente, dans ledit plan, une courbure telle que sa composante directionnelle, dans la direction de rotation, augmente au fur et à mesure de l'augmentation du rayon.

9. Dispositif de décharge selon la revendication 7 ou 8, caractérisé par le fait que le profil antérieur (28) présente une courbure telle que sa composante directionnelle, dans la direction de rotation, augmente au fur et à mesure de l'augmentation du rayon.

10. Dispositif de décharge selon la revendication 7, 8 ou 9, caractérisé par le fait que l'orifice d'admission (23, 32) présente une étendue dans la direction de rotation, et est délimité et entouré par un bord muni d'une région marginale antérieure (33) en amont, et d'une région marginale postérieure (34) en aval, au moins la région marginale postérieure (34) occupant, au cours du fonctionnement, une position radialement extérieure à la surface libre du liquide, et une ligne droite (35), tracée à travers lesdites régions marginales (33, 34), forme un angle (V) présentant une tangente à la surface libre du liquide sur l'orifice d'admission (32), le sommet dudit angle (V) étant orienté dans la direction de rotation, et ledit angle étant supérieur à 20°, mais inférieur à 50°.

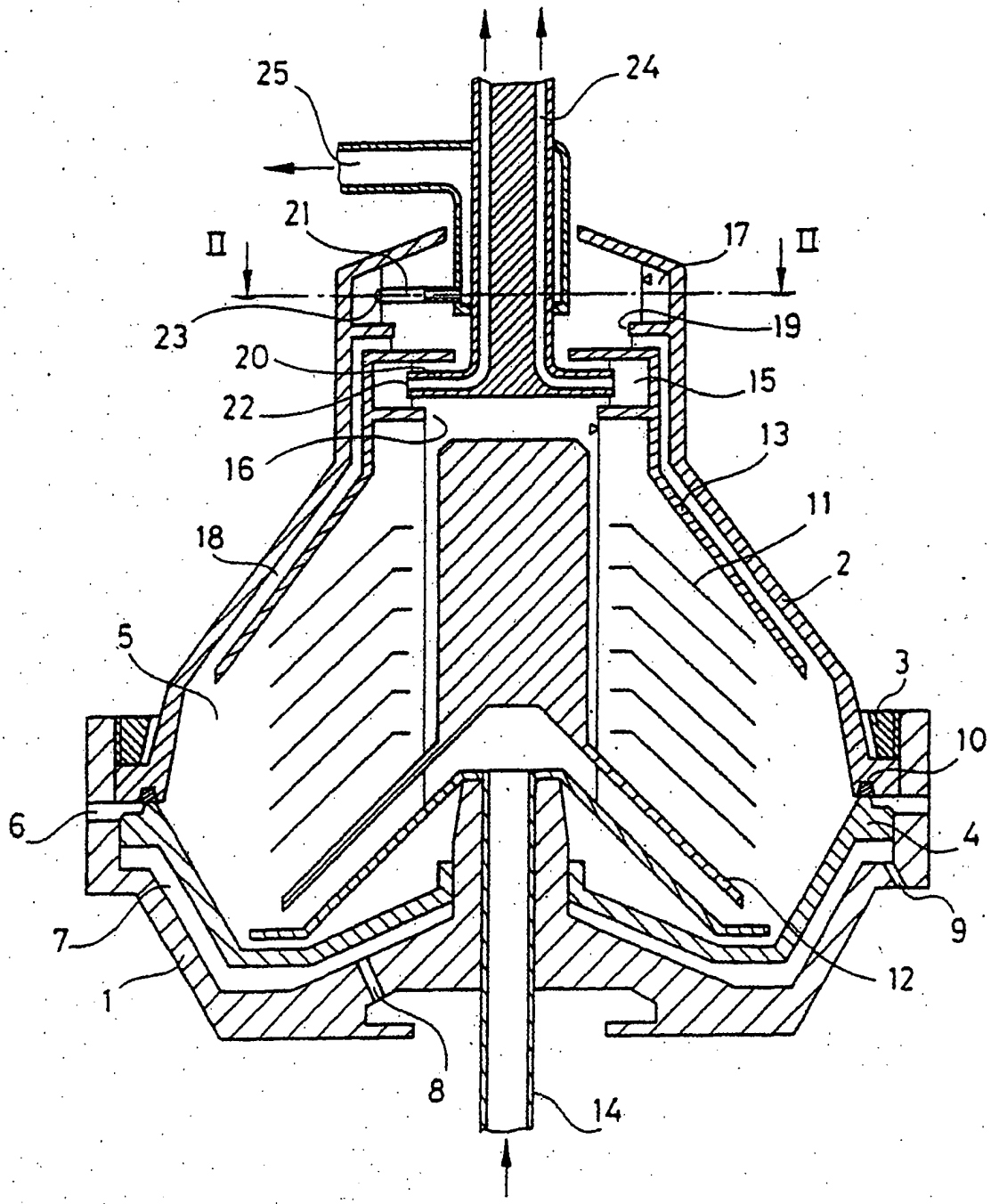

Fig.1

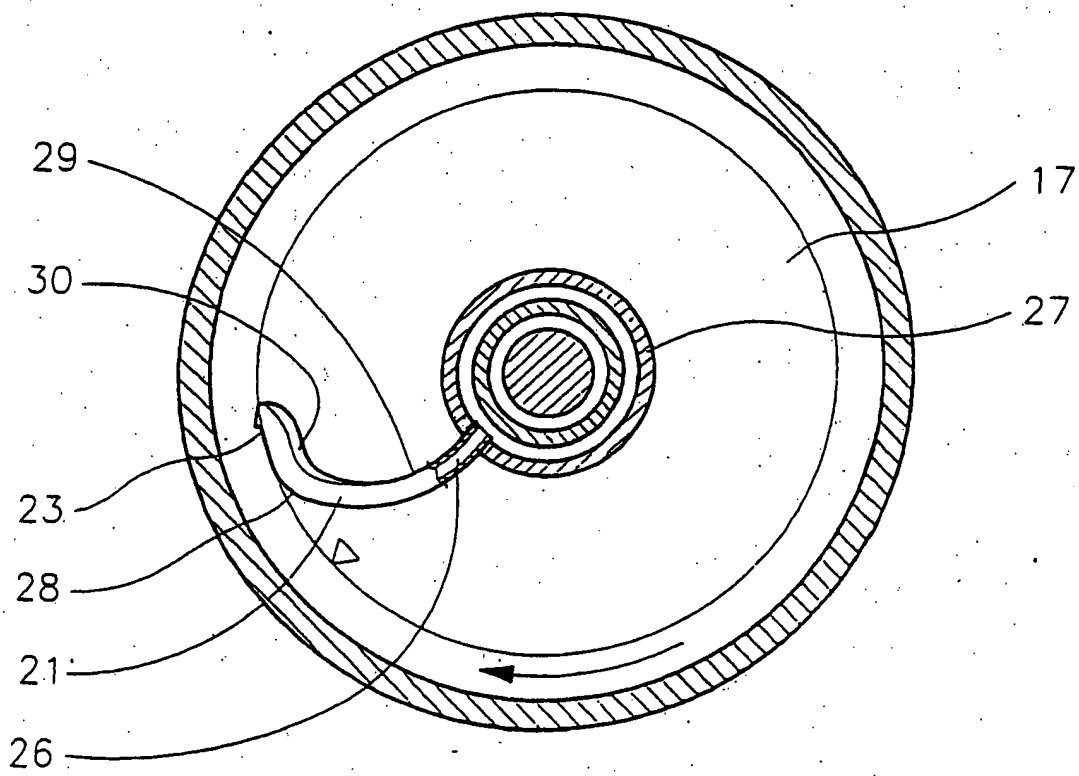

Fig.2

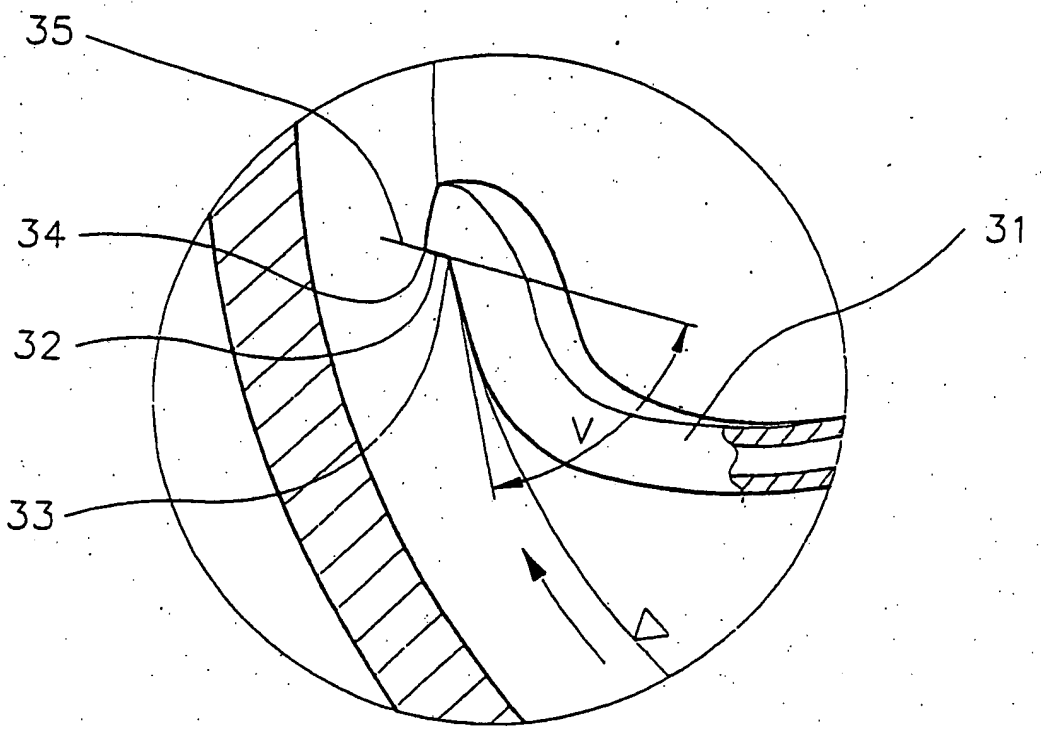

Fig.3